

MassGIS Data Viewer *Student Training*

Focus: Watersheds.....Ecological Address

Local Perspective

Lesson #3

Introduction

Social Studies
Mathematics
Language Arts
Science

“My Ecological Address”

Background: Everywhere is part of a watershed. It may be the size of the Mississippi, or the size of a stream near your home or school. Because we are all part of Mega, Major and Sub Watersheds, we can all contribute to pollution. Our effects can be negative or positive on these systems, depending upon our understanding of their dynamics and relationships. Our actions upon our own properties or school grounds can have impacts on the larger aspects of watershed systems. One person applying some chemicals in their backyard, multiplied by many others doing the same activity can have disastrous impacts on area, state and regional watershed systems.

Problem: The purpose of this lesson is to provide you with an opportunity to locate your home or school within watersheds. In addition, we will use Lesson #3 to review the major skills your learned in earlier lessons.

Your Task: Using the MassGIS Data Viewer, you will create a View that shows either the location of your home or school in your community. Using your skills acquired in Lessons #1 and #2, you will explore watershed information, practice previous skills, learn some new skills and be able to demonstrate that all areas are interconnected through watersheds. As the questions are asked in the Skill section, record your answers on the Data Sheet. When finished, you will be asked to complete a “position statement” that provides evidence from information you have gained in Lessons #1 #2, #3 that your school or home is connected to others within the state by means of watershed systems.

Mass Data Viewer Skills:

- *Adding Feature Themes to a View*
- *Legend Editor (Symbol Changes: Fill Palette, Color Palette, Pen Palette)*
- *Making a Layout*
- *Making a “Locus Map” for Insertion into the Layout*
- *Using the Extent Manager*
- *Setting the Distance Units*
- *Labeling Theme Features*
- *Using the Export and Print Options*

Viewer Buttons and Tools:

- *Using the “Z” Button*
- *Magnification Tool*
- *Pan Tool*
- *Draw Tool*
- *Label Tool*

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Data Viewer Skills

Social Studies Mathematics Language Arts Science

“My Ecological Address”

Creating My Home or School Watershed

1. Beginning the Viewer:

- Open the MassGIS Data Viewer with the theme “MA Towns” in the Table of Contents.
- Maximize the Viewer window and make “MA Towns” theme active.
- Use the Identification Tool to find your community.

Hint: Other methods may be used to locate your community. If you prefer, use the “Select Tool” and click on your community shape in the “MA Towns” image. With your cursor, use the “Zoom to Selected” button. Or use the **Z** button to zoom to your town.

- Once you have located your community, use the Zoom tool, and the Pan tool to create a View that shows your community in the center of the View. (This may not be necessary if you used the “Zoom to Selected” button or the **Z** button)

2. Using the Extent Manager to Create a New Extent:

- With your cursor, go to the View menu and select “User Extent Manager”. When asked, select “Save Current Extent” and click OK.
- In the “Save Current extent” window type your community’s name. Click OK

3. Testing the Power of the Extent Manager:

- With the cursor, select “Zoom to Full Extent” button.
- With the cursor, click on the “Z” button. In its window, select “user-defined Extents”. Click OK.

- c. Scroll through the list and select your community's name that was typed previously when you created a new extent. Click OK.

Hint: The View should change to an enlarged view of your community and the area immediately around it. You can use this extent in the future to locate your community quickly. However, if you are using the MassGIS Data "Runtime" Viewer without ArcView 3.1 or higher, you will have to create this option each time you are working with the software. In the "Runtime Version," the program will not save any extents you have created in previously opened sessions.

4. Adding Themes to the View's Table of Contents

- a. Using the "A" button, add the following themes as they are listed in the chart below.

<u>Layer Categories</u>	<u>Specific Layers</u>	<u>Specific Layers</u>
Physical Resources	Watersheds	Sub-basins..Outlines
Physical Resources	Hydrography	Lakes and Ponds..25K
Physical Resources	Hydrography	Rivers and Streams..25K
Infrastructure	Census TIGER Roads	TIGER road segments (arcs)

5. Setting the Distance Units

- a. Go to the View menu and select "properties"
- b. Examine the View properties window. Keep the map units as "meters"(this should never change because all the MassGIS data is in meters), but make the distance units "feet". Click OK

6. Finding Your Home or School

- a. Examine the View closely. Locate the area where your home or school is situated. With the "Magnification tool", draw a rectangle around this area.
- b. Use the "Pan" tool to place your road and home or school location within the center of the View window. Check the scale bar at the upper right corner of the View window. Be sure it is within the 15,000 to 10,000 range. If not, use the cursor to remove the number and type in a number between the range of 15,000 and 10,000. Hit the Enter key on your keyboard.

7. Placing a Marker for Your Home or School

- a. Go to the “Window” menu and select “Show Symbol Window”.
- b. In the “Symbol Window”, select the “Marker” icon. When the Marker icon window opens, select a circle with a black dot in the middle.
- c. Make the size of the symbol “16”. Click on the “Paint Brush” icon (Color Palette) and make the foreground a bright red. The marker symbol you have selected, should now turn red in the Marker icon window. Close the “Color Palette” window.
- d. With the cursor, select the “Draw Point” tool. Use the pull down menu to select the “dot” tool.
- e. Move the cursor (which now becomes a cross), over where you think your home or school is located. Click once for the icon to appear. When the icon appears it will have some black squares around it, these are called handles and indicate that this is a selected graphic. Move your cursor to the tool bar and convert it to the “pointer”. Click once in the View, and the black boxes around the marker will disappear.

Hint: If you make an error and click too many times, or place the marker in the wrong location, remember you can remove it. Go to the pointer tool and convert the cursor to a pointer tool. Move the pointer tool over the marker icon you wish to remove and click once. This process will “select” the graphic. Hit the delete key on your keyboard to remove the marker.

8. Labeling the Roads near Your Home or School

- a. Make the “TIGER Roads” theme active if not already active. Go to the “Theme” menu and select “properties”. A “Theme Properties” window appears. Notice there are icons in the left part of the window. With the cursor, select the “Text Labels” icon.
- b. In the “Label” window, select the “Label Field” that is “Street”. Click OK
- c. With the cursor, go to the “Label” tool and select the “Label” icon.
- d. Return to the View and click on the roads you want to be labeled in the View. You should pick your street or the school’s street and two or three others near your home or school.

9. Changing the Appearance of the Themes in the View

- a. Make the “Sub-Basin” theme active. Double click the symbol to show the Legend Editor. In the Editor, double click the symbol. Change the subbasin

- outline to 2. Click Apply. Close the “Legend Editor” window. Close the “Fill Palette” window.
- b. Make the “TIGER Roads” theme active. Double click the theme so its Legend Editor opens. Double click the road symbol. In the “Pen Palette” window, change the size from 0.1 to 1. Click on the “Paint Brush” icon (Color Palette). Make the foreground red. Click Apply . Close the Legend Editor and Color Palette windows.
 - c. Double click the “TIGER Roads” theme and in the Legend Editor window, next to Symbol under the Label Column, type “roads”. Click apply and close the Legend Editor window.
 - d. Make the “Lakes and Ponds” theme active. Examine the View and notice which symbols shown in the Table of Contents are not in your enlarged View. We will remove any symbols not shown in your View. Double click in the “Lakes & Ponds” theme area to open its Legend Editor. Select a symbol not shown in your view, and click on the delete icon at the bottom of the symbol window. The icon looks similar to an X. Repeat this process for all symbols not shown in your View.
 - e. Make the remaining symbols in the “Lakes and Ponds” theme a brighter color. If the following symbols are remaining, change them to these colors by using the Color Palette. Double click the symbol and in the “Fill Palette”, select the “Paint Brush” icon. Remember to use the foreground and/or outline.

Cranberry Bog	To a bright red
Tidal Flat	Leave as shown
Impoundment	Leave as shown
Dam	Leave as shown
Surface Waters	Foreground to a bright blue, Outline to a bright blue

When finished, click Apply” and close the Legend Editor and the Color Palette windows.

- f. Make the “Rivers & Streams” theme active. Double click on its symbol to open the Legend Editor. Double click each value individually to change it to 1. Click apply and close the Legend Editor and the Pen Palette windows.

10. Labelling Areas in the View

- a. With the cursor, select the “Text” tool. In the pull down menu, pick the label with a line and the letter T. The cursor changes to a dot in a circle. Move the cursor over your home or school location symbol. Hold down the left mouse and drag it

into the white space in the View. A Text window will appear. Type the following depending on the location and click OK.

My Home
My School

- b. With the Sub-basin theme still active, make the cursor the “I” tool. Using the “I” tool, click in the areas in your View that represent the sub-basins. ***(1) Write down the sub-basin names that are shown as you click the “I” tool.*** (Data Sheet).
- c. Make the Sub-basins theme active. Go to the theme’s properties. Select the “Text Label” icon. Make the “Label Field”, “sub-name”. Click OK. Return to the View.
- d. Open the Windows menu and select “Show Symbol Window”. Select the “Font Palette”. Make the font arial, the size 14, and the style bold. Close the window.
- e. With the cursor, select the “Text” tool. In the Text tool pull down menu, select the “Call Out Label”.
- f. In the View place the circle/dot cursor in an area within each sub-basin, and draw out to a white space. Release the mouse. A “Text Properties” window appears. Type the sub-basin name. Refer to your Data Sheet for the correct names. Type as the example below:

Nashua Sub-basin

11. Preparing the Layout for Export or Printing

- a. Go to the “View” menu and select Layout. In the “Map Output Window”, select 8.5 x 11. Click OK.
- b. In the next window, type the title: “MY HOME’S WATERSHED” or “MY SCHOOL’S WATERSHED”.
- c. Be sure the layout is “landscape”
- d. When the Layout window opens notice we still need some additional information. We will add the community in the Layout and also a “Locus” image so we can visualize where our community is located within the state’s watersheds.

DO NOT CLOSE THE LAYOUT WINDOW – DO NOT CLOSE THE PROJECT – ALL WORK WILL BE LOST.

- e. Go to the “Window” menu and select “Show Symbol Window”. Select the “ABC icon”. Make the font “arial”, the size “14” and the style “bold”.
- f. Return to the Layout window. Go to the “Text” tool and select the “banner text” label. Move the circle/dot cursor into the Layout to the left of the directional symbol (north, east, south, west).
- g. Type your community’s name. It will appear in the Layout. Be sure you are not using all capital letters. See the example below: Click OK.

Leominster, MA

- h. Use the cursor (pointer) to select and move the graphic. Move the community name graphic so it is just to the left of the directional symbol in the Layout.

12. Adding a Locus Map to the Layout.

- a. Return to your view. Under the View dropdown menu, select “create overview”. A list of the themes in your current view will appear and you will be prompted for the themes to add to your locus or overview.
- b. Select “MA Towns” and “Watershed...Outline”, by holding down the shift key and clicking on the themes.
- c. Now a new view will be created that shows the State & Town outlines and the Watershed outlines, but most importantly, a red box has been inserted that shows the exact extent of your layout map.

13. Adding the Newly Created Locus Map to Your Layout

- a. In the “Layout1” menu go to the “View Frame” tool (shaped like a globe). The cursor will become a cross.
- b. With the cursor move to a space over the Legend and draw a box by holding down the left mouse. Once the box is drawn, a window will open, “View Frame Properties”.
- c. In the “View Frame Properties” window, is listed any views in the project, including “Overview for MassGIS Runtime Data Viewer”. Double click on this and it will fill the empty frame you just created.
- d. Your Layout should now be ready for printing, or for saving as a jpeg file.

14. Printing or Saving the Layout as a JPEG File.

- a. If you are printing the Layout, go to the File menu and select “Page Layout”. Be sure your printer is set to “Landscape”.
- b. Return to the File menu and select Print.
- c. If you are exporting the Layout as a JPEG to be used later. Go to the File menu and select “Export”
- d. In the “Export” window navigate to the area where you want the Layout stored. We suggest c:\windows\temp.
- e. When you have arrived at the area where you will store the Image, select in “List Files of Type” the JPEG option. In “File Name” type “Home Watershed”.
- f. Click OK.

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Data Sheet

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Name: _____ Date: _____

1. List the names of the Sub-basins where your home or school is located in your community?

2. Examine the location of your home or school in the View (In the “Layout” if it has been printed). Think about the human activities that your family and neighbors carry out on their property. List any activities that could have negative impacts on the sub-basins where your home is located.

3. If contaminants such as road salt, oils from automobiles entered the groundwater near your home, in what direction do you think they would flow in order to reach a surface water system? (Use the back of this sheet for additional space)

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Recommendation Sheet

Social Studies Mathematics Language Arts Science

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Name: _____ Date: _____

Task: In the space below, complete a “Position Statement” of at least one paragraph that supports “We are all connected by Watersheds, and our human activities determine the overall quality of these Watersheds.” Use evidence discovered from using the MassGIS Data Viewer in Lessons #1, #2, and #3.